XYPEX®

BIO-SAN® C500

Antimicrobial Crystalline Technology

For protection of concrete in severe sewage conditions

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Antimicrobial Crystalline Technology for protection of concrete in severe sewage conditions.

Xypex Bio-San C500 is a unique way of protecting concrete in harsh sewage conditions where hydrogen sulphide causes microbial induced corrosion (MIC). No other admixture combines potent antimicrobial properties with Xypex crystalline waterproofing technology to offer protection of concrete sewer and wastewater structures.

Xypex Bio-San C500 contains mineral solids that remain permanently fixed within the concrete throughout the life of the sewage structure. These kill acid-generating microbes such as Thiobacillus that proliferates in H_2S conditions thus inhibiting microbial induced corrosion. Combined with Xypex's proven crystalline technology, Bio-San C500 will protect concrete from infiltration and exfiltration as well as resisting acid and sulphate attack. After placement and curing, the crack-healing properties of Xypex will continue to function throughout the service life of the concrete.

As with all Xypex Admix products, Bio-San C500 is added at the time of concrete batching, avoiding the potential quality issues of liners or coatings and eliminating schedule delays for surface preparation. As a one-component product, Bio-San C500 simplifies the production process for pre-cast structures.

Xypex Bio-San C500 is recommended for use in sewage systems especially in areas where H_2S gas is likely to accumulate. This includes sewer lines with long retention times (flat, long, low flow) and sealed or unvented manholes. It will also include areas of high turbulence such as lift stations, drop structures, and head works as well as various areas within wastewater treatment plants.

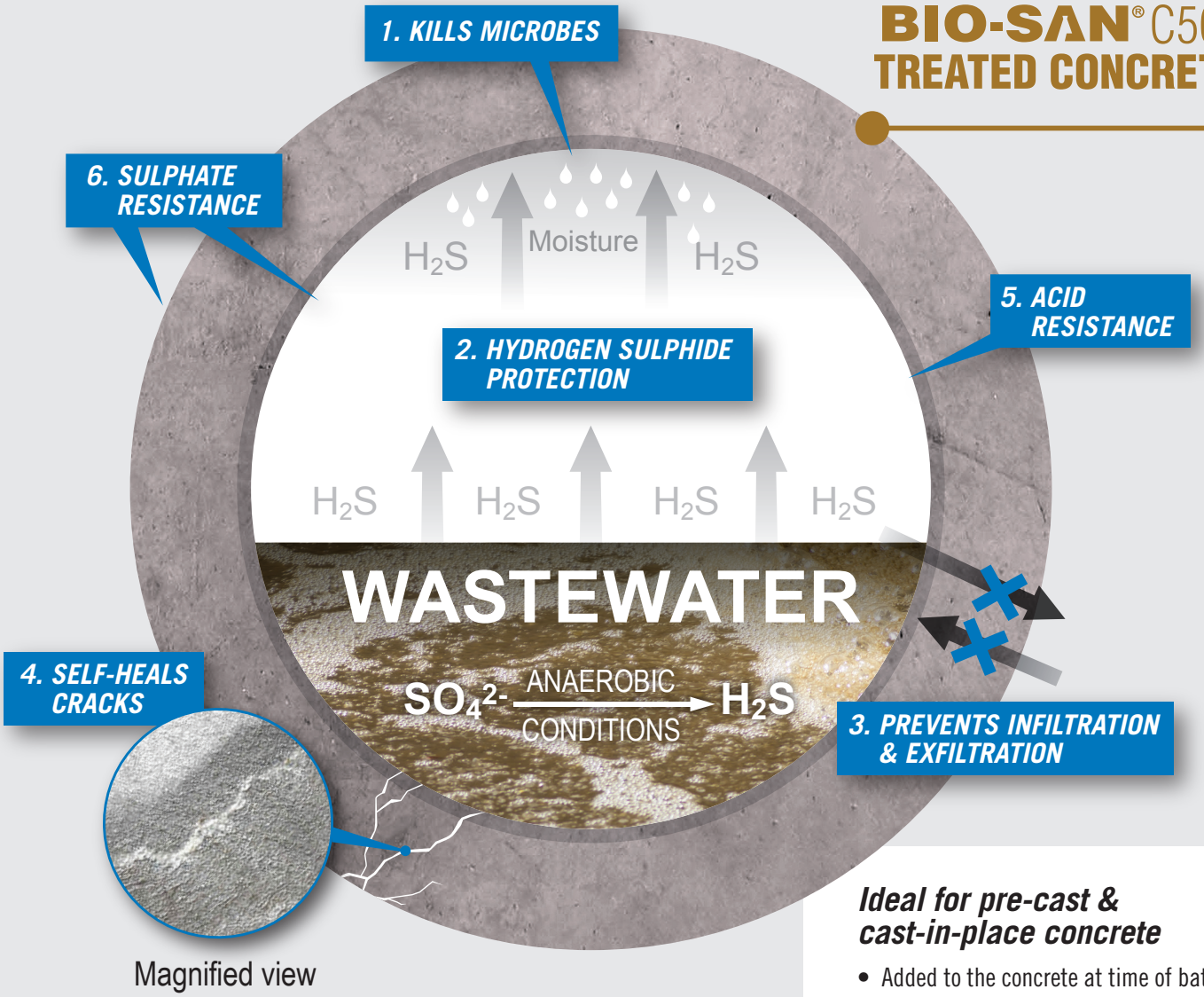
Microbial induced corrosion can seriously reduce the service life of concrete sewer structures and wastewater treatment plants.

- Long retention sewer lines
- Manholes
- Headworks
- Lift stations
- Drop structures
- Enclosed sewage plant structures

Xypex Megamix II with Bio-San is a resurfacing mortar specifically designed for the restoration of deteriorated concrete surfaces caused by microbial induced corrosion, abrasion/erosion and chemical attack. It is formulated for ease of application, superior bond, low shrinkage, high strength and resistance to microbial, acid and sulphate attack. Xypex Megamix II with Bio-San is a one component mortar and can be spray or trowel applied at a thickness of 10 - 50 mm per layer. The high performance characteristics of Megamix II with Bio-San are enhanced by Xypex's unique crystalline waterproofing and protection technology. In most applications, such as manhole resurfacing, Megamix II with Bio-San can be used to replace epoxy linings and calcium aluminate repair mortars.

XYPEX®

BIO-SAN® C500 TREATED CONCRETE



Ideal for pre-cast & cast-in-place concrete

- Added to the concrete at time of batching
- No need for liners and coatings
- Saves time in production and installation
- Extends the service life of concrete in wastewater structures

Added to concrete at the time of batching, Xypex Bio-San C500...

1. ***KILLS*** *the microbes that cause concrete corrosion in sewage environments*
2. ***PROTECTS*** *concrete in areas of hydrogen sulphide buildup*
3. ***PREVENTS*** *the infiltration and exfiltration of liquids even under extreme hydrostatic pressure*
4. ***SELF-HEALS*** *static cracks up to 0.5 mm*
5. ***PROTECTS*** *concrete in acidic environments*
6. ***PROTECTS*** *concrete in sulphate environments*

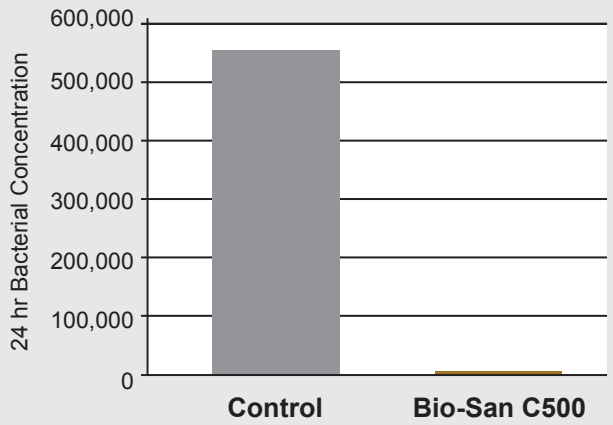
PROVEN TECHNOLOGY

1 Kills the acid-generating microbes present in sewage environments

Independent testing showed that in concrete treated with Xypex Bio-San C500 the presence of the sewer bacteria Thiobacillus Novellus (Starkeya Novella) was substantially reduced.

MIC-106

Microbe Reduction

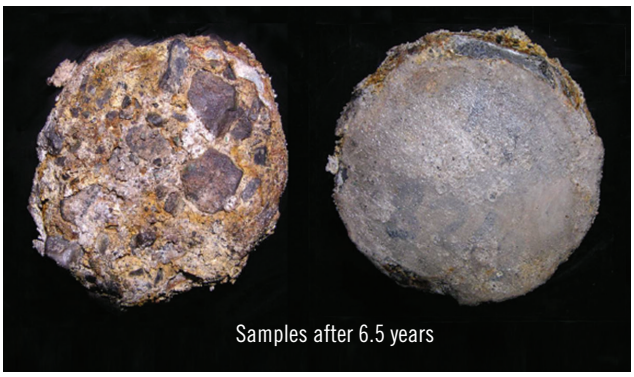


TEST METHOD: Adapted method ISO 22196 determination of antibacterial resistance of concrete to Thiobacillus Novellus/Starkeya Novella.

2 Protects concrete in areas of H_2S buildup

Specimens of concrete treated with Xypex Bio-San C500 as well as untreated concrete were hung in the enclosed sedimentation tanks at a wastewater facility with H_2S concentrations of between 20 to 70 ppm. The photos of the untreated concrete show the extent of the microbial induced corrosion after 6.5 years. After 10 years, the concrete treated with Xypex Bio-San C500 had 9 times less corrosion than the untreated concrete, and continued to function at full efficacy.

MIC-101



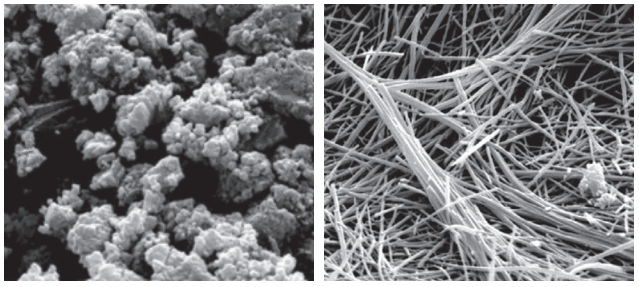
UNTREATED CONCRETE BIO-SAN C500 TREATED CONCRETE

3 Contains Crystalline Technology

Xypex Bio-San C500 contains the same unique crystalline technology as all Xypex Admix products. Xypex treated concrete resists extreme hydrostatic pressure, protects concrete against aggressive chemicals such as acids or sulphates and self-heals static cracks up to 0.5 mm.

In a site test, Xypex treated and untreated samples were analyzed using Scanning Electron Microscopy. Xypex treated samples showed conclusive evidence of the dense crystalline matrix typical of Xypex Crystalline Technology.

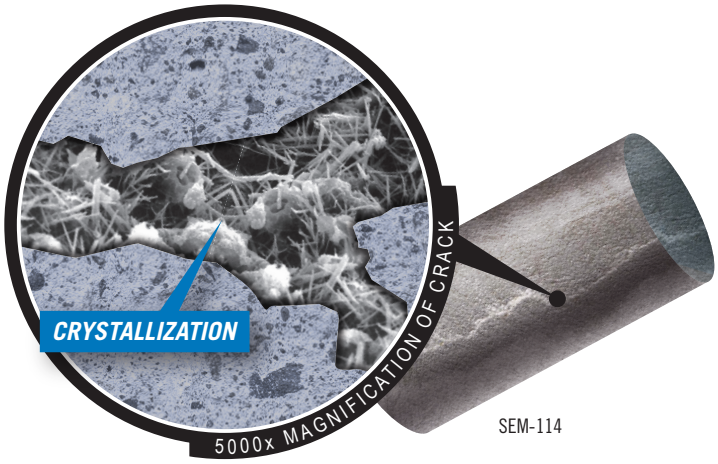
SEM-110



UNTREATED CONCRETE XYPEX TREATED CONCRETE

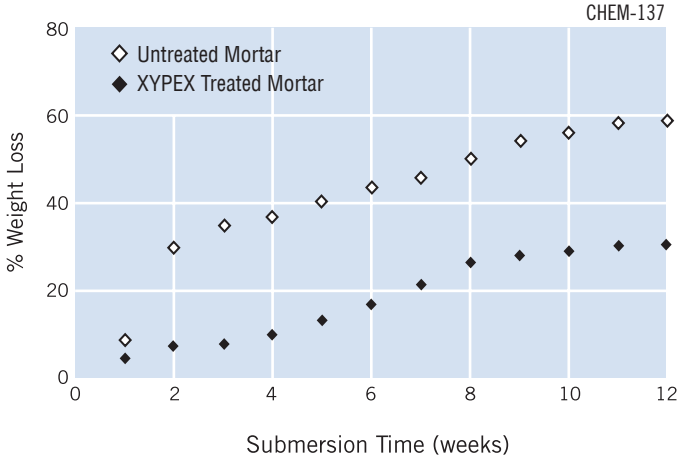
4 Self-heals cracks up to 0.5 mm

Concrete panels were cast and then cracked by force after which they were subjected to the ponding of water to measure the flow through the crack. After four days the 0.38 mm crack on the Xypex treated sample had stopped leaking completely. The 0.25 mm crack in the control sample continued to leak after 25 days.



SEM-114

CHEM-137



5 Protects concrete in acidic conditions

Cement mortar samples containing Xypex were subjected to 5% sulphuric acid for up to 12 weeks. Compared to untreated control samples, the weight loss caused by acid attack was reduced by 48%. In a further test on a 30% fly-ash mortar, the weight loss was reduced to 53%.

6 Protects concrete in sulphate environments

Samples of both Xypex treated and untreated concrete were placed in a highly concentrated sulphate solution. After 4 months the untreated samples experienced a weight loss of 4,800 g/m^2 whereas the Xypex treated samples only lost between 5 g/m^2 and 50 g/m^2, showing no visible signs of surface deterioration.

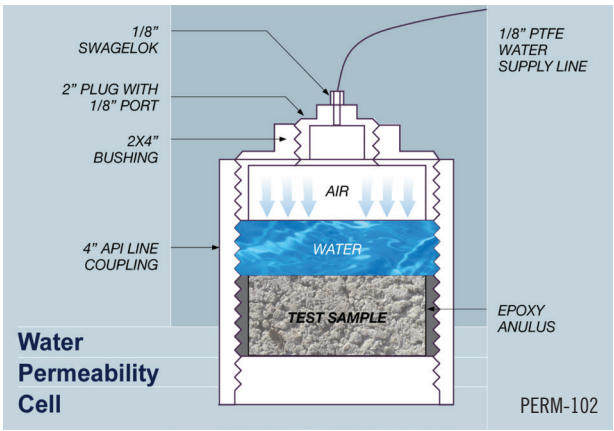
CHEM-132

UNTREATED CONCRETE

XYPEX TREATED CONCRETE

7 Prevents infiltration & exfiltration of liquids even under extreme hydrostatic pressure

When subjected to 107 m (350 ft) of hydrostatic pressure Xypex treated samples completely resisted the flow of water and only allowed water penetration of 1.5 mm (0.06 in). Conversely, untreated control samples started leaking within 24 hours.



PERM-102

BIO-SAN® Projects

River Island Sewage Pump Station, California, USA
Pump/Lift Station • Xypex Bio-San C500

American Furniture, Texas, USA
Manholes • Xypex Bio-San C500

Fairchance Borough, Pennsylvania, USA
Precast Manholes • Xypex Bio-San C500

Roaring Fork Club, Colorado, USA
Lift Station • Xypex Bio-San C500

Chatham Park WWTP, North Carolina, USA
Catch Basin & Manholes • Xypex Bio-San C500

South Lathrop Commons, California, USA
Wet Well/Pump Station • Xypex Bio-San C500, Xypex Megamix II with Bio-San

Xypex products and services are available in over 90 countries. *Being there* means we know the territory and that knowledge benefits our customers.

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